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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,876	02/24/2004	Vijay D. Parkhe	008850 USA/CPI/COPPER/PJS	1903

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EXAMINER	
MOORE, KARLA A	

ART UNIT	PAPER NUMBER
1763	

MAIL DATE	DELIVERY MODE
08/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/786,876	PARKHE ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20 and 58-85* is/are pending in the application.

4a) Of the above claim(s) *11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-20 and 58-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *0407*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The declaration under 37 CFR 1.132 filed 20 December 2006 is sufficient to overcome the rejection of the previously pending claims based upon the Parkhe et al. and Boyd et al. references.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3, 7-10, 12-15, 17, 65-66 and 68-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,736 to Anderson et al. in view of U.S. Patent No. 7,160,616 to Massler et al.

4. Anderson et al. disclose a substrate support substantially as claimed and comprising: (a) a substrate support structure (Figures 1 and 3, 11); and (b) a coating (21) on the support structure, whereby the contact surface of the coating is capable of reducing abrasion and contamination of a substrate that contacts the surface (column 3, row 65 through column 4, row 12 and column 4, row 66 through5, row 5).

5. However, Anderson et al. fail to teach the coating comprising a carbon-hydrogen network, and the coating having a contact surface comprising a coefficient of friction of less than about 0.3 and a hardness of at least about 8 GPa.

6. Massler et al. teach providing a coating of diamond-like carbon (DLC) with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on a structure/substrate where wear protection, corrosion protection and improvement of slipping properties and the like are of importance (abstract and column 20, about rows 16-48).

7. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the coating comprising a DLC coating with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on the substrate support in in Anderson et al. in order to impart wear protection, corrosion protection and improvement of slipping properties and the like as taught by Massler et al.

8. With respect to claims 2 and 3, the coating of Massler et al. comprises a diamond-like carbon (abstract).

9. With respect to claims 7-8, in Anderson et al., the support structure comprises: a ceramic, dielectric (SiO_2) covering an electrode (13); and a plurality of mesas (19) on the dielectric, the mesas comprising the coating with the contact surface thereon.

10. With respect to claim 9, Massler et al. discloses the provision of a metal-containing adhesion layer (i.e. adhesion layer) (column 4, rows 21-30).

11. With respect to claim 10, the support structure of Anderson et al. further comprise a heat exchanger comprising at least one of a heater and conduits (12) for passing a heat exchange fluid there through.

12. With respect to claim 12, see above description of the teachings of Anderson et al. and Massler et al. and where Massler et al. teach that the metal-adhesion layer may comprise titanium (column 4, rows 21-30).

13. With respect to claim 13, see above description of the relied upon prior art.

14. With respect to claims 14 and 15, the coating of Massler et al. comprises a thickness of from about 1 to about 20 microns and the titanium layer comprises a thickness from about 0.25 microns to about 4 microns (column 5, rows 16-21).

15. With respect to claim 17, see above description.

16. With respect to claims 65-66 and 68-69, see above description of the relied upon prior art.

17. Claims 4-6, 16 and 18, 20, 58-64 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable Anderson et al. and Massler et al. as applied to claims 1-3, 7-10, 12-15, 17, 65-66 and 68-69 above, and further in view of U.S. Patent No. 5,352,493 to Dorfman et al.

18. Anderson et al. and Massler et al. disclose the substrate support substantially as claimed and as described above.

19. However, Anderson et al. and Massler et al. fail to teach the diamond-like material comprises a diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen.

20. Dorfman et al. teach providing diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen as a protective film for the purpose of providing a coating having high strength and microhardness, flexibility, low coefficient of friction, and high thermal and chemical stability (abstract). Dorfman et al. further teach providing the diamond-like material comprising from about 0.1 atom % to about 10 atom % of a metal additive, whereby the metal additive changes the resistivity of the coating (Figures 1A-C and 2; column 4, row 43 through column 5, row 20).

21. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen as a protective film in order to provide a coating having high strength and microhardness, flexibility, low coefficient of friction, and high thermal and chemical stability as taught by Dorfman et al.

22. With respect to the process by which the DLC layer with metal additive is deposited (e.g. claims 20), Dorfman et al. disclose a method wherein the diamond-like material is co-deposited with a metal additive by a process of combining physical vapor deposition (PVD) of the metal additive in a plasma enhanced chemical vapor deposition (PECVD) environment (column 5, row 57 through column 6, row 37). However, it is also noted that courts have ruled "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

23. With respect to claims 58-64, 67, see above description of the relied upon prior art.

24. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable Anderson et al. and Massler et al. as applied to claims 1-3, 7-10, 12-15, 17, 65-66 and 68-69 above, and further in view of U.S. Patent No. 5,728,765 to Dorfman et al (2).

25. Anderson et al. and Massler et al. disclose the substrate support substantially as claimed and as described above.

26. However, Anderson et al. and Massler et al. fail to teach the diamond-like material is provided over a dielectric ceramic such AlN or Al_2O_3.

27. Dorfman et al (2). teach that such a diamond-like material may provided over a dielectric, ceramic such as AlN or Al_2O_3 for corrosion resistance (abstract and column 10, rows 61-65).

28. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the diamond-like material over a dielectric ceramic such as AlN or Al_2O_3 in order to impart corrosion resistance as taught by Dorfman et al (2).

29. Claims 70-77 and 82-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,736 to Anderson et al. in view of U.S. Patent No. 7,160,616 to Massler et al. and U.S. Patent No. 5,352,493 to Dorfman et al.

30. Anderson et al. disclose a substrate support substantially as claimed and comprising: (a) a substrate support structure (Figures 1 and 3, 11); and (b) a coating (21) on the support structure, whereby the contact surface of the coating is capable of reducing abrasion and contamination of a substrate that contacts the surface (column 3, row 65 through column 4, row 12 and column 4, row 66 through5, row 5). Further, in Anderson et al., the support structure comprises: a ceramic, dielectric (SiO2) covering an electrode (13); and a plurality of mesas (19) on the dielectric, the mesas comprising the coating with the contact surface thereon.

31. However, Anderson et al. fail to teach the coating comprising a carbon-hydrogen network, and the coating having a contact surface comprising a coefficient of friction of less than about 0.3 and a hardness of at least about 8 GPa.

32. Massler et al. teach providing a coating of diamond-like carbon (DLC) with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on a structure/substrate where wear protection, corrosion protection and improvement of slipping properties and the like are of importance (abstract and column 20, about rows 16-48). Massler et al. further disclose the provision of a titanium adhesion layer below the diamond-like carbon layer (column 4, rows 21-30).

33. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the coating comprising a DLC coating with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on the substrate support in in Anderson et al. in order to impart wear protection, corrosion protection and improvement of slipping properties and the like as taught by Massler et al.

34. Anderson et al. and Massler et al. disclose the substrate support substantially as claimed and as described above.

35. However, Anderson et al. and Massler et al. fail to teach the diamond-like material comprises a diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen.

36. Dorfman et al. teach providing diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen as a protective film for the purpose of providing a coating having high strength and microhardness, flexibility, low coefficient of friction, and high thermal and chemical stability (abstract). Dorfman et al. further

teach providing the diamond-like material comprising from about 0.1 atom % to about 10 atom % of a metal additive, whereby the metal additive changes the resistivity, which is from about 10^4 ohm·cm to about 10^8 ohm·cm, of the coating (Figures 1A-C and 2; column 4, row 43 through column 5, row 20).

37. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen as a protective film in order to provide a coating having high strength and microhardness, flexibility, low coefficient of friction, and high thermal and chemical stability as taught by Dorfman et al.

38. With respect to claims 59 and 60, the coating of Massler et al. comprises a diamond-like carbon (abstract).

39. With respect to claims 61-63 and 71-73, the nanocomposite of Dorman et al. is structured as claimed and as described above.

40. With respect to claim 64, the dielectric of Anderson et al. is structured as claimed and as described above.

41. With respect to claims 74-77 and 82-85, see above description of the relied upon prior art. In addition with respect to claims 82-85 and the recitations therein regarding the process by which the DLC layer with metal additive is deposited, Dorfman et al. disclose a method wherein the diamond-like material is co-deposited with a metal additive by a process of combining physical vapor deposition (PVD) of the metal additive in a plasma enhanced chemical vapor deposition (PECVD) environment

(column 5, row 57 through column 6, row 37). However, it is also noted that courts have ruled "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

42. Claims 78-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,736 to Anderson et al. in view of U.S. Patent No. 7,160,616 to Massler et al. and Dorfman et al (2).

43. Anderson et al. disclose a substrate support substantially as claimed and comprising: (a) a substrate support structure (Figures 1 and 3, 11); and (b) a coating (21) on the support structure, whereby the contact surface of the coating is capable of reducing abrasion and contamination of a substrate that contacts the surface (column 3, row 65 through column 4, row 12 and column 4, row 66 through5, row 5). Further, in Anderson et al., the support structure comprises: a ceramic, dielectric (SiO2) covering an electrode (13); and a plurality of mesas (19) on the dielectric, the mesas comprising the coating with the contact surface thereon.

44.

45. However, Anderson et al. fail to teach the coating comprising a carbon-hydrogen network, and the coating having a contact surface comprising a coefficient of friction of less than about 0.3 and a hardness of at least about 8 GPa.

46. Massler et al. teach providing a coating of diamond-like carbon (DLC) with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on a structure/substrate where wear protection, corrosion protection and improvement of slipping properties and the like are of importance (abstract and column 20, about rows 16-48). Massler et al. also teach providing a titanium metal-adhesion (column 4, rows 21-30).

47. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the coating comprising a DLC coating with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on the substrate support in in Anderson et al. in order to impart wear protection, corrosion protection and improvement of slipping properties and the like as taught by Massler et al.

48. Anderson et al. and Massler et al. disclose the substrate support substantially as claimed and as described above.

49. However, Anderson et al. and Massler et al. fail to teach the diamond-like material is provided over a dielectric ceramic such AlN or Al_2O_3.

50. Dorfman et al (2). teach that such a diamond-like material may provided over a dielectric, ceramic such as AlN or Al_2O_3 for corrosion resistance (abstract and column 10, rows 61-65).

51. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the diamond-like material over a dielectric ceramic such as AlN or Al_2O_3 in order to impart corrosion resistance as taught by Dorfman et al (2).

52. With respect to claim 79, see above description of the relied upon prior art.

53. With respect to claims 80, the coating of Massler et al. comprises a thickness of from about 1 to about 20 microns and the titanium layer comprises a thickness from about 0.25 microns to about 4 microns (column 5, rows 16-21).

54. With respect to claim 81, Dorfman et al. (2) teach providing a diamond-like material comprising a diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen for corrosion resistance (abstract).

Allowable Subject Matter

55. The indication of allowable subject matter with respect to claims 9, 15-16 and 18-20 is withdrawn in view of the newly discovered reference(s) to Anderson et al., Massler et al., Dorfman et al. and Dorfman et al. (2). Rejections based on the newly cited reference(s) follow.

Response to Arguments

56. Applicant's arguments with respect to claims 1-10, 12-20 and 58-82 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KARLA MOORE
PRIMARY EXAMINER
Art Unit 1763
22 June 2007